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ABSTRACT

A description of this basic arithmetic program includes an outline of its goals, features contained in a teacher's manual, task cards and supplementary resource materials, steps involved in the implementation of the program, and answers to some questions about the program. An outline of the training program is given along with a workshop schedule. Other features of the program described include visitation procedures, essential commercial materials, and adoption responsibilities. (MP)

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Diagnostic Prescriptive Arithmetic

OF
STATEN ISLAND

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NATIONAL DIFFUSION NETWORK
ESEA TITLE IV—C

New York City
Board of Education
Community School District 31
Staten Island, New York

DIAGNOSTIC PRESCRIPTIVE ARITHMETIC

DEVELOPER/DEMONSTRATOR PROJECT

NATIONAL DIFFUSION NETWORK

E.S.E.A. TITLE IV-C

This project was selected and is supported by the U.S. Office of Education and the New York State Education Department to disseminate effective innovations in education.

DIAGNOSTIC PRESCRIPTIVE ARITHMETIC

THE PLUS THAT MAKES THE DIFFERENCE

- + D.P.A. IS A BASIC ARITHMETIC PROGRAM
- + D.P.A. IS FOR CHILDREN OPERATING AT AN INSTRUCTIONAL LEVEL FROM GRADE 2 THROUGH 6
- + D.P.A. USES DIAGNOSTIC ARITHMETIC TESTING TO IDENTIFY CONCEPTUAL WEAKNESSES AND SKILL DEFICIENCIES
- + D.P.A. DEVELOPS AND MODELS CONCEPTS THROUGH HANDS-ON EXPERIENCES WITH PHYSICAL MATERIALS
- + D.P.A. PROVIDES OPPORTUNITIES FOR INDIVIDUAL AND SMALL GROUP INSTRUCTION
- + D.P.A. STUDENTS HAVE ACHIEVED AN AVERAGE GAIN OF 15 MONTHS FOR 7 MONTHS OF INSTRUCTION.
- + D.P.A. IS A NATIONALLY VALIDATED PROGRAM - NATIONAL DIFFUSION NETWORK
E.S.E.A. TITLE IV-C

D.P.A. HAS AS ITS GOALS

- to emphasize the use of diagnostic testing.

Diagnostic test analysis provides realistic direction for planning.

- to aid teachers to better meet the "individual" needs of their students.

Simplified record sheets have been devised to help teachers GROUP students and PLAN for these groups.

- to promote the use of concrete materials throughout the grades as a means of developing and modeling basic arithmetic concepts.

Ones, tens and hundreds pieces are used to model the concepts of place value, exchange or decimal fractions.

- to foster a more positive attitude toward mathematics among both students and teachers.

Daily success experiences are provided through estimations, gaming and activities at the students' level.

- to inspire teachers' confidence in their mathematical competency.

Treatments for MATHOPHOBIA are given during the D.P.A. 3 day training workshop.

To facilitate dissemination and implementation of D.P.A., a Teacher's Manual, task cards and supplementary resource materials have been prepared.

The Teacher's Manual includes:

1. Activities for -

COUNTING
PLACE VALUE
ADDITION
SUBTRACTION
MULTIPLICATION
DIVISION - of whole numbers

These tested activities comprise experiences for -

CONCEPT DEVELOPMENT - REINFORCEMENT - PRACTICE & DRILL

Each activity is written in the following format:

OBJECTIVES : Specific concepts and skills to be learned or practiced.

ACTIVITY FOR: Individual child, small group, or whole class.

MATERIALS : Physical materials needed and directions for making game boards, numeral cards, recording sheets, etc.

DESCRIPTION : A developmental sequence for the activity, lesson or game.

EXTENSIONS : Follow-up activities and alternative approaches.

2. A description of a diagnostic-prescriptive approach to the teaching of basic arithmetic concepts and skills.

3. Record keeping procedures and devices to aid in planning and grouping.
4. Instructions for designing and developing a variety of "teacher-made" materials.
5. Classroom management topics for implementing an individualized activity-oriented program.
6. On-going mathematics experiences for estimating and approximating; renaming numbers; data collection and utilization and applications of the arithmetic skills.

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IMPLEMENTATION

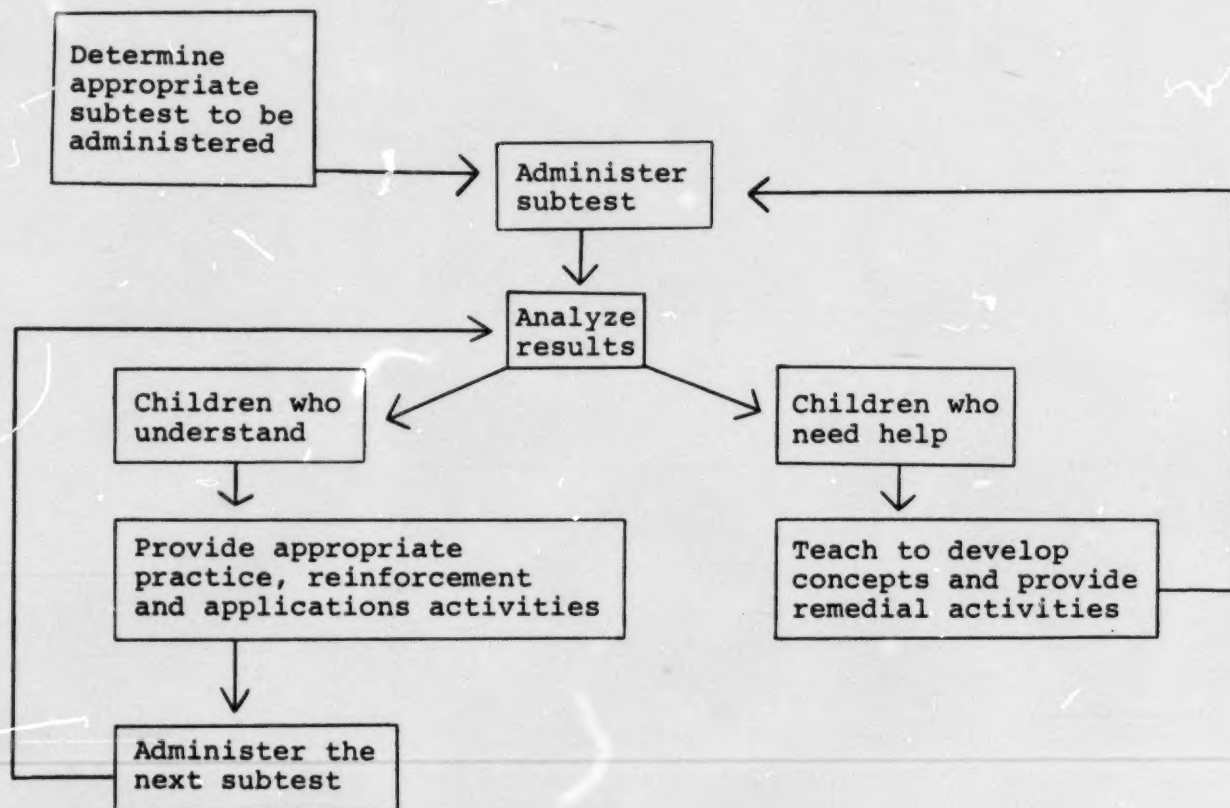
D.P.A. can function in elementary grade classes as the arithmetic component of a mathematics program or as a co-curricula remediation program under Title I. In the latter case a special math resource teacher is employed and serves only those students in the greatest academic need.

A school district's selection of one of these options would depend upon its students' needs and the availability of human and financial resources.

Essentially both approaches are the same. The diagnostic test is administered and the results are analyzed for general trends and specific needs. The data is recorded on the analysis chart which aids the teacher in forming instructional groups and planning her program. Each student begins at his level of understanding. He may work with or without the teacher: in a large group, small group or independently. He may use concrete materials for modeling a basic

concept; he may work with a D.P.A. board game for reinforcing a new skill. He may complete a written activity for practice or he may help in the school by applying his arithmetic to a "real life" situation.

The diagram below outlines the D.P.A. process.



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ANSWERS TO SOME QUESTIONS

Originally developed in 1971 as a Title I program, D.P.A. has since expanded beyond remediation and is being used successfully by regular classroom teachers as an integral part of their mathematics program.

The program grew from a local need for a re-emphasis of the basic arithmetic. This need apparently exists in school districts throughout the country since the D.P.A. staff through the National Diffusion Network, and TITLE IV-C has trained more than 2,100 teachers in 90 communities throughout the country.

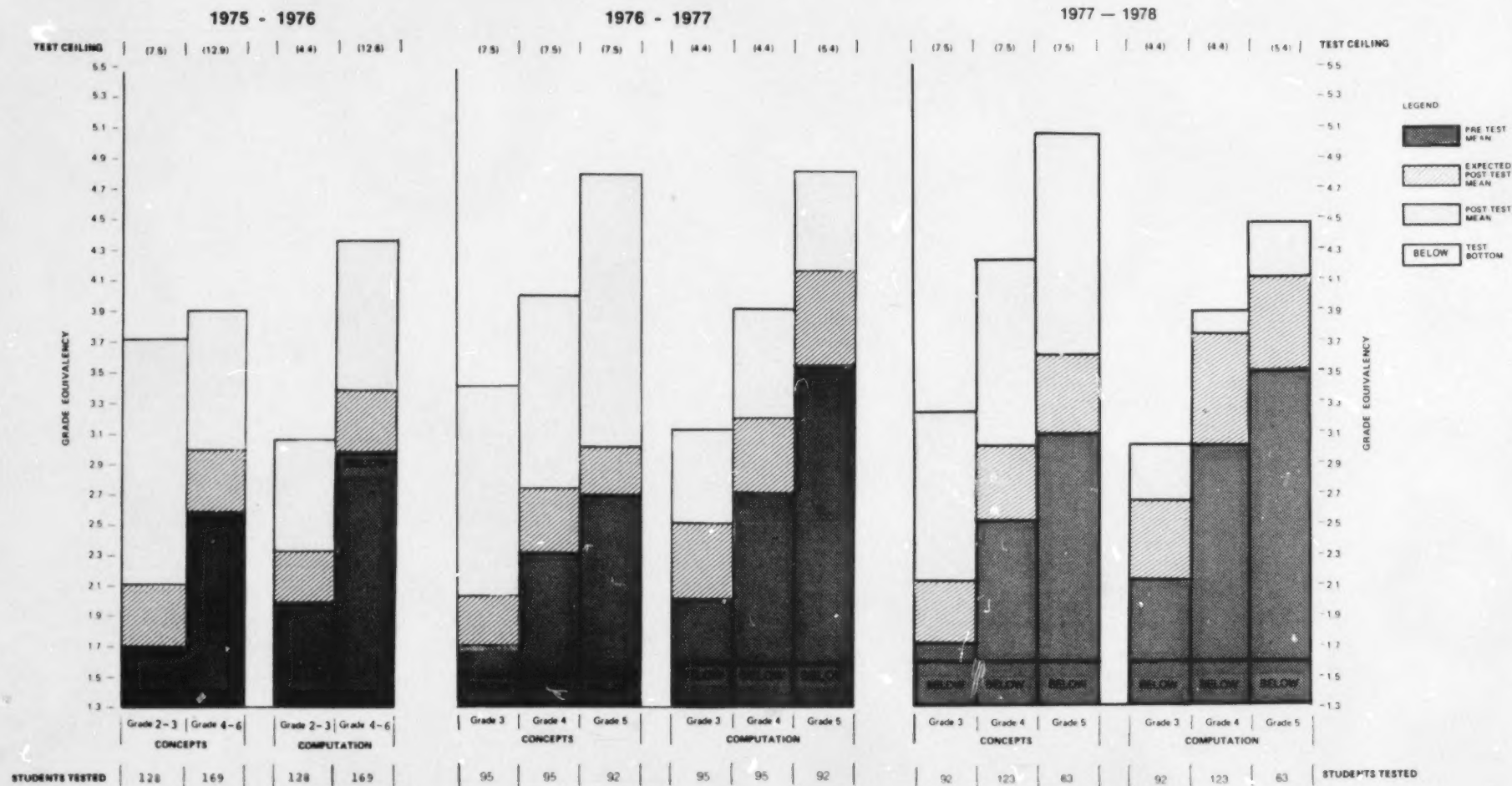
The program incorporates a lab approach and objective based experiences and activities for counting, place value, addition, subtraction, multiplication and division. It provides opportunities for individual and small group instruction.

In the early days of the program, weekly staff meetings were held. Successes and failures in our work with the children were shared. Those lessons, activities and experiences as well as management models that really worked were exchanged and discussed. These ideas formed the basis of the D.P.A. Teacher's Manual.

The Stanford Diagnostic Arithmetic Test was selected as our diagnostic instrument for the following reasons:

- (a) its scope, the basic arithmetic concepts and skills, is consistent with the topics we wished to emphasize.
- (b) it provides the grade equivalents necessary for evaluating program results.

D.P.A. PROGRAM RESULTS



TRAINING WORKSHOP

The training will include:

A. RATIONALE AND PHILOSOPHY

1. Program background
2. Diagnostic vs. achievement testing
3. Meeting individual needs through small group instruction
4. Activity oriented learning

B. DIAGNOSTIC TECHNIQUES

1. Administering the Stanford Diagnostic Arithmetic Test (S.D.A.T.)
2. Interpreting results
 - a. identifying deficiencies
 - b. item analysis
 - c. using the S.D.A.T. Teacher's Manual
3. Designing diagnostic instruments

C. PRESCRIPTIVE APPROACHES

1. Planning for the individual child or group
2. The developmental sequence of arithmetic concepts and skills
3. The use of concrete materials for concept development and reinforcement through hands on experiences.
4. The use of project activities for motivation, concept development, practice and reinforcement

D. CLASSROOM MANAGEMENT

1. Grouping for instruction
 - a. whole class
 - b. small group

- c. individual
 - d. conversion pairing
- 2. Routines for movement of children and materials
- 3. Recordkeeping
 - a. class analysis chart
 - b. using the item analysis
 - c. individual progress charts -
teacher records - pupil records

The workshop participants will be involved in the following:

1. Activities to be used to develop a positive mind-set for mathematics.
2. The preparation of teacher-made project materials.
3. Examination of commercial materials - books and hardware used as supplements to the project materials.
4. Discussions with project personnel concerning specific situations and/or problems anticipated by adopters.

Workshop participants will receive:

- D.P.A. Teacher's Manual
- Stanford Diagnostic Arithmetic Test sample kit
- Accompanying apparatus for activities in D.P.A. Manual
- Supplementary project resource materials

OUTLINE OF D.P.A. WORKSHOP SCHEDULE

<u>DAY 1</u>	<u>DAY 2</u>	<u>DAY 3</u>
Introduction and overview of D.P.A. program. (slide presentation)	Project activities for concept development. (large group)	Project activities for reinforcement and practice. (large group)
Arithmetic scope and sequence of D.P.A.	Concept development through the use of concrete materials.	On-going classroom mathematics activities.
Project activities for motivation and reinforcement. (large group)	Concept reinforcement through the use of "bridge" materials.	Classroom management topics.
Diagnostic interpretations and prescriptive approaches.	Recordkeeping procedures for a diagnostic prescriptive approach.	D.P.A. and regular mathematics program.
Exploring mathematics principles through project activities.	Activities for applying basic arithmetic to real situations.	Project activities for practice and reinforcement; material oriented. (small groups)
Concept development through the use of concrete materials.	Project activities for practice and reinforcement; material oriented. (small groups)	Lab work - preparation of teacher made program materials. (individual)
Project activities for concept development and skill reinforcement; material oriented. (small groups)	Lab work - preparation of teacher made program materials. (individual)	Questions and answers.

VISITATION PROCEDURES

The project staff welcomes visitors to view the program in operation. Appointments should be made and confirmed at least two weeks in advance.

For additional information, appointments, etc. please contact:

Mr. Matthew Scaffa,
Program Director
Community School District #31
211 Daniel Low Terrace
Staten Island, New York 10301

Tel: (212) 447-3637

ESSENTIAL COMMERCIAL MATERIALS (PER CLASS)

<u>Item</u>	<u>Quantity and Description</u>	<u>Approximate Cost</u>
D.P.A. Teacher's Manual	(1) Manual per classroom teacher	\$ 5.25
Squared Place Value Material	(1) Class set	14.25
Unifix Cubes	(1) box of 500	24.00
Stanford Diagnostic Arithmetic Test	(2) sets @ \$11.00 including answer keys	22.00
Cubical Counting Blocks	(1) box of 100	4.75
Coin stamps	(1) box	6.00
SEE Calculators	(10) @ \$2.50	25.00
Oak tag	About 50 sheets (at least 9" by 14")	

D.P.A. has an additional listing of suggested commercial materials including resource and reference books. Vendors' names and addresses are given. This list is available upon request.

ADOPTION RESPONSIBILITIES

DIAGNOSTIC PRESCRIPTIVE ARITHMETIC

The staff of D.P.A. agrees to provide the following services for an adopting district:

- A. Three days of pre-implementation training in the essential elements of D.P.A. (see D.P.A. "Training Workshop").
- B. Teacher's manuals and other project-developed material to those staff members attending training workshops.
- C. Technical assistance and follow-up consultation for the staff of the adopting district.
 1. Telephone and written consultation as needed or requested by the adopting district.
 2. On-site visits by D.P.A. staff as required.

ADOPTING DISTRICT

To be eligible for the training and consultation services of D.P.A. the staff of an adopting district must agree to:

- A. Provide release time for teachers and supervisors to attend the training session.
- B. Select an administrator or supervisor to serve as a liaison person between the district and D.P.A. staff.
- C. Submit to D.P.A. the following information:
 1. Needs assessment statement
 2. Local district plan for implementation

- D. Provide the commercial materials necessary to implement D.P.A. (see "Essential Commercial Materials" list)
- E. Implement the essential elements of D.P.A.
 - 1. Use of the Stanford Diagnostic Arithmetic Test as a Pre and Post diagnostic and evaluative instrument.
 - 2. Employ the D.P.A. Student Progress Charts, for recordkeeping and planning.
 - 3. Group for instruction based on diagnostically inferred needs and deficiencies.
 - 4. Use the activities and procedures described in the D.P.A. Manual and teacher training program.
 - 5. Encourage cooperative planning and exchange among program teachers.
- F. Allow D.P.A. to have a minimum of one year trial period.
- G. Complete an evaluation of the program's success based upon the cooperative analysis of the pre and post S.D.A.T. results. On site evaluation by D.P.A. staff and other validated instruments the district may use for assessment.

ADOPTION AGREEMENT

Date

District Name _____

Designated Project Coordinator

Name _____

Address _____

Title _____

Proposed Training-workshop dates _____

Proposed date for implementation _____

Implementation Plan _____

L.E.A. Chief School Officer

Curriculum Coordinator or
Building Principal

Matthew Scaffa,
Project Director